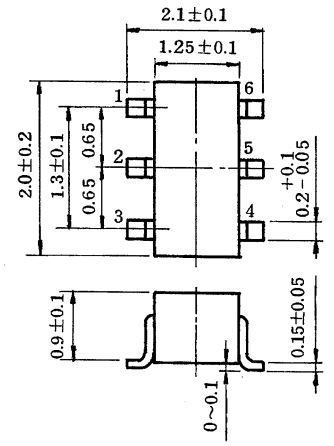
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process)

RN2967,RN2968,RN2969

Switching, Inverter Circuit, Interface Circuit
And Driver Circuit Applications

- Including two devices in US6 (ultra super mini type with 6 leads)
- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN1967~RN1969

Unit: mm

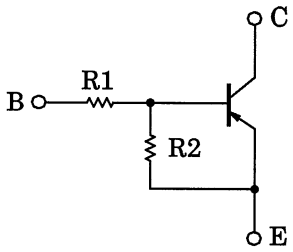


1. EMITTER 1 (E1)
2. EMITTER 2 (E2)
3. BASE 2 (B2)
4. COLLECTOR 2 (C2)
5. BASE 1 (B1)
6. COLLECTOR 1 (C1)

JEDEC	—
JEITA	—
TOSHIBA	2-2J1B

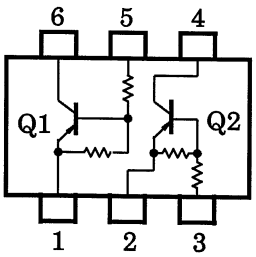
Weight: 6.8mg (typ.)

Equivalent Circuit and Bias Resistor Values



Type No.	R1 (kΩ)	R2 (kΩ)
RN2967	10	47
RN2968	22	47
RN2969	47	22

Equivalent Circuit (Top View)



Absolute Maximum Ratings (Ta = 25°C) (Q1, Q2 Common)

Characteristic		Symbol	Rating	Unit
Collector-base voltage	RN2967~2969	V_{CBO}	−50	V
Collector-emitter voltage		V_{CEO}	−50	V
Emitter-base voltage	RN2967	V_{EBO}	−6	V
	RN2968		−7	
	RN2969		−15	
Collector current	RN2967~2969	I_C	−100	mA
Collector power dissipation		P_C*	200	mW
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−55~150	°C

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook (“Handling Precautions”/“Derating Concept and Methods”) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

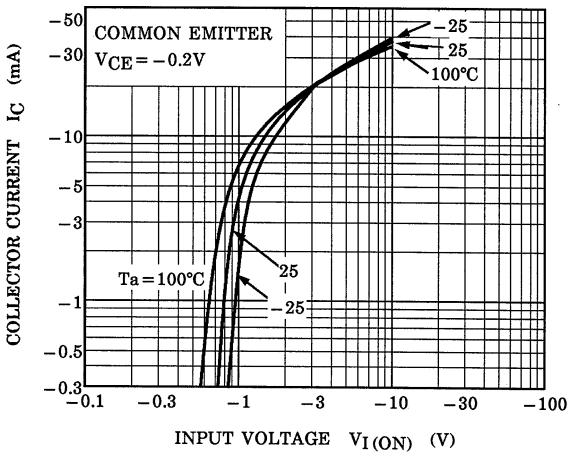
* : Total rating

Electrical Characteristics (Ta = 25°C) (Q1, Q2 Common)

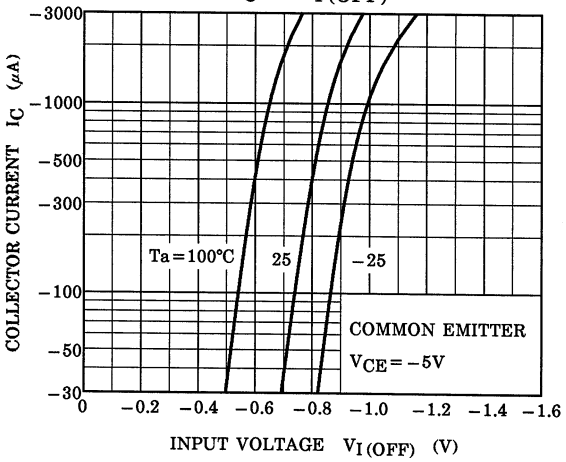
Characteristic		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	RN2967~2969	I_{CBO}	—	V_{CB} = −50V, I_E = 0	—	—	−100	nA
		I_{CEO}	—	V_{CE} = −50V, I_B = 0	—	—	−500	
Emitter cut-off current	RN2967	I_{EBO}	—	V_{EB} = −6V, I_C = 0	−0.081	—	−0.15	mA
	RN2968		—	V_{EB} = −7V, I_C = 0	−0.078	—	−0.145	
	RN2969		—	V_{EB} = −15V, I_C = 0	−0.167	—	−0.311	
DC current gain	RN2967	h_{FE}	—	V_{CE} = −5V, I_C = −10mA	80	—	—	—
	RN2968		—		80	—	—	
	RN2969		—		70	—	—	
Collector-emitter saturation voltage	RN2967~2969	$V_{CE\ (sat)}$	—	I_C = −5mA, I_B = −0.25mA	—	−0.1	−0.3	V
Input voltage (ON)	RN2967	$V_{I\ (ON)}$	—	V_{CE} = −0.2V, I_C = −5mA	−0.7	—	−1.8	V
	RN2968		—		−1.0	—	−2.6	
	RN2969		—		−2.2	—	−5.8	
Input voltage (OFF)	RN2967	$V_{I\ (OFF)}$	—	V_{CE} = −5V, I_C = −0.1mA	−0.5	—	−1.0	V
	RN2968		—		−0.6	—	−1.16	
	RN2969		—		−1.5	—	−2.6	
Translation frequency	RN2967~2969	f_T	—	V_{CE} = −10V, I_C = −5mA	—	200	—	MHz
Collector output capacitance	RN2967~2969	C_{ob}	—	V_{CB} = −10V, I_E = 0, f = 1MHz	—	3	6	pF
Input resistor	RN2967	R1	—	—	7	10	13	kΩ
	RN2968		—		15.4	22	28.6	
	RN2969		—		32.9	47	61.1	
Resistor ratio	RN2967	R1/R2	—	—	0.191	0.213	0.232	—
	RN2968		—		0.421	0.468	0.515	
	RN2969		—		0.09	2.14	2.35	

(Q1, Q2 Common)

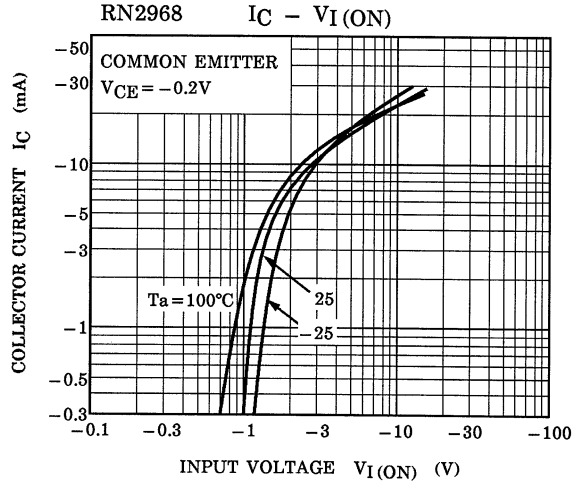
RN2967 I_C – $V_{I(ON)}$



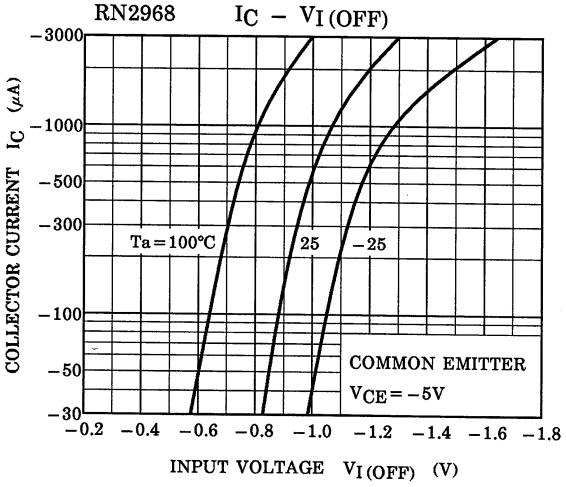
RN2967 I_C – $V_{I(OFF)}$



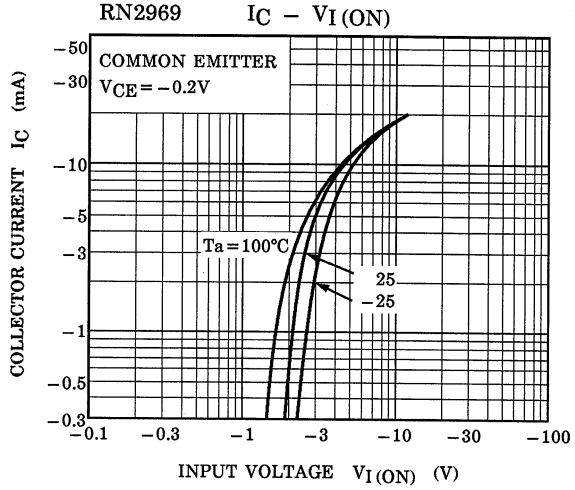
RN2968 I_C – $V_{I(ON)}$



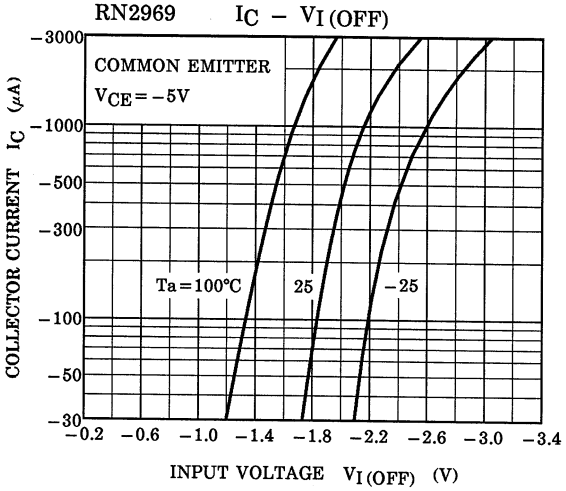
RN2968 I_C – $V_{I(OFF)}$



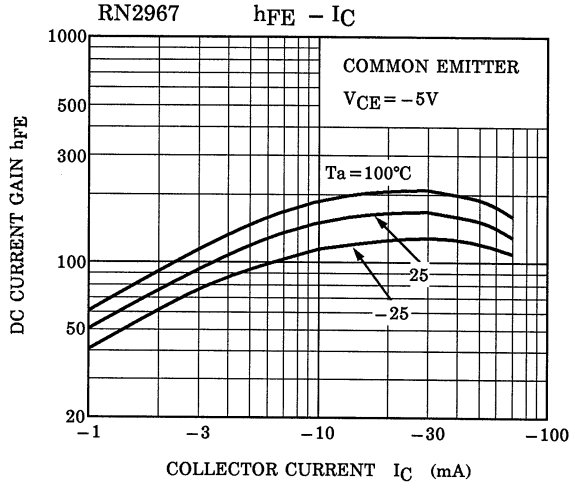
RN2969 I_C – $V_{I(ON)}$

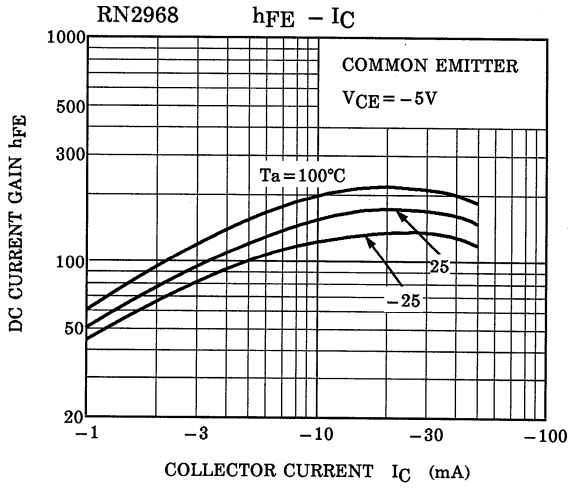


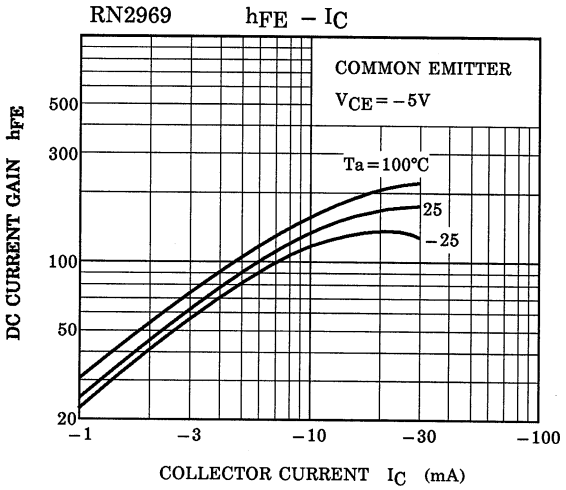
RN2969 I_C – $V_{I(OFF)}$

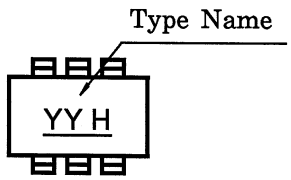
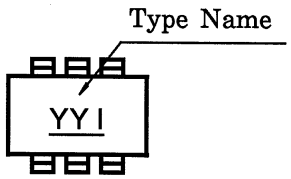
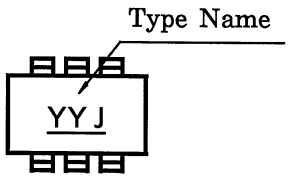


(Q1, Q2 Common)







Type Name	Marking
RN2967	
RN2968	
RN2969	

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